



State Specifications for the Use of Cullet as Construction Aggregate

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Material: Recycled Glass

Issue: Glass cullet is increasingly used for a variety of construction applications, including general backfill, roadway construction, utility bedding and backfill, drainage medium, and miscellaneous uses such as landfill cover, sandblasting, and underground storage tank backfill. Specifications for individual states are based on local variables such as aggregate sources and climate. Understanding the way various states have approached the development of specifications for glass aggregate will improve the national knowledge base on the subject. This best practice describes specifications of some states for the use of cullet aggregate. Any reader with knowledge about additional state specifications or corrections to the information below is asked to contact ReTAP at the number below. The information below is severely summarized. Contact local authorities for the full text of individual specifications.

Best Practice:

Washington State: The Washington State Department of Transportation (WSDOT) permits the use of recycled glass as an additive up to 15% to unbound aggregate used for seventeen specific applications, including a number of fill and ballast uses. No more than 10% of the glass should be retained on a ¼-inch sieve. WSDOT also provides specifications for construction aggregates composed entirely of cullet. These aggregates may be used for wall backfill, rigid and flexible pipe bedding, drainage backfill, drainage blankets, and gravel borrow. The cullet must be smaller than ¾-inch, and should contain no more than 5 percent by weight of material finer than a No. 200 sieve. The maximum debris content, including all non-glass constituents, is 10% as identified by visual methods. In addition, the glass supplier must test the total lead content of the cullet on a quarterly basis according to EPA methods 3010/6010. The mean of these tests cannot exceed 80 parts per million lead. Complete specifications are available in [another report](#).

Oregon: The Oregon Department of Transportation has issued Special Provisions with bid specifications allowing the use of up to 100% recycled glass in a number of applications: drainage blanket (SP00360 QA, 4-23-98, added subsection 00360.12 Reclaimed Glass), utility bedding and backfill (SP00405 QA, 8-27-98, modified 00405.12 Bedding and 00405.13 Backfill), subsurface drains (SP00430 QA, 4-23-98, added subsection 00430.12 Reclaimed Glass). One hundred percent of the glass must pass a 1/2 inch sieve, with a maximum of 5% by weight finer than 200 mesh. Maximum debris content is 5% or 10%, as specified per application, determined by visual classification.

California: The California Department of Transportation (CalTrans) has accepted cullet specifications for Class 1, 2, 3, and 4 base and Class 2 and 3 subbase roadway aggregate for the support of flexible and rigid pavements. These aggregates can consist entirely of cullet, or a mixture of cullet and other reclaimed materials, such as asphalt concrete, cement concrete, lean concrete base, and cement treated base. The different classes of base and subbase aggregate are distinguished by gradations. The size of the cullet used must follow the size criteria specified for those aggregate applications by CalTrans. Material used in these base and subbase aggregates must be free of organic material and other deleterious substances. Surfacing material must be placed over all aggregate bases and subbases containing glass cullet.

Connecticut: The State of Connecticut specifies that aggregate used for roadway embankments may contain up to 25% by weight of cullet smaller than one-inch. Aggregate containing cullet cannot be placed within five feet from the face of any slope.

New York: The New York State Department of Transportation (NYSDOT) allows aggregate for embankments to contain up to 30% by volume of glass cullet. In addition, roadway subbase material may contain up to 30% by weight of glass cullet. Cullet used for these applications must be smaller than 3/8-inch, and should contain no more than 5% by volume of ceramics and non-glass materials, based on visual

inspection. Waste glass cannot be placed in contact with any synthetic liners, geogrids, or geotextile material.

New Hampshire: The New Hampshire Department of Transportation (NHDOT) allows glass cullet to replace 5% by weight of the dry aggregate used for roadway base course material. The material used to produce this cullet should consist primarily of recycled food and beverage glass containers. Small amounts of ceramics and plate glass are also permitted, although glass containing hazardous or toxic materials is not allowed. The cullet must be smaller than ½-inch in size, and not more than 1½% of the material smaller than a No. 4 sieve should be smaller than a No. 200 sieve. NHDOT requires that all base course be tested for compliance with this gradation prior to placement. Post-placement visual inspection of the base course is also required. Base course containing cullet must be capped with non-cullet aggregate before the public is allowed to drive over the material.

Note: A review of this Best Practice conducted during May, 2001, updated and inserted links to original documents when they could be found. Specifications concerning the use of glass by State DOT's without links in the sections above should be confirmed by interested parties before proceeding.

Implementation: In practice, state departments of transportation have not been volume users of recycled glass aggregate. More important, the acceptance by DOT's of glass specifications allows local city or private sector specifying engineers to have confidence in the use of glass in their own projects. Each state must develop its own specifications based on existing information, local climate, and material resources. The information here will help to inform states on activities across the country.

Benefits: The development of state-by-state material specifications will promote the use of cullet as a supplement or alternative to natural aggregates. Local cullet specifications will also allow glass processing facilities to prepare and supply cullet, which satisfies the pertinent specifications.

Application Sites: Design offices, glass processing facilities, construction sites, test laboratories.

Contact: For more information about this Best Practice, contact CWC <mailto:info@cw.org>.

References:

Connecticut Supplemental Specification Section 1.01, 2.02, 2.07.

New Hampshire Department of Transportation Standard Specifications, Special Provision, Amendment to Section 304 - Aggregate Base Courses, 1992.

New York State Department of Transportation Standard Specifications, amended 1994.

Specifications for Glass Aggregate: Washington State Department of Transportation, ReTAP Technology Brief, Clean Washington Center, Seattle, WA, 1994.

Standard Specifications, 1992, amended 1995, State of California, Business, Transportation and Housing Agency, Department of Transportation, Sacramento, CA.

Understanding Oregon Department of Transportation Specifications for the Use of Reclaimed Glass in Construction Applications, Oregon Department of Environmental Quality, 1996.

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